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U. S. DEPARTMENT OF AGRICULTURE.

FARMERS' BULLETIN No. 184.

MARKETING LIVE STOCK

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WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1903.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
Washington, D. C., November 4, 1903.

SIR: I have the honor to transmit herewith a manuscript on the subject of "Marketing live stock," by Prof. Charles S. Plumb, of the Ohio State University. The live-stock industry is one of the great industries of our country, and I feel sure that the suggestions offered in this article for facilitating the marketing of live stock will prove useful and be widely appreciated. I therefore recommend that the manuscript be published as a Farmers' Bulletin.

Respectfully,

D. E. SALMON,
Chief of Bureau.

Hon. JAMES WILSON,
Secretary.

2

CONTENTS.

	Page.
Introduction	5
Buying and selling in country districts.....	5
Periodical auction sales	6
Auction sales in Great Britain.....	7
A typical local horse auction.....	7
Rules and methods in Chicago horse market.....	9
Prominent metropolitan markets	10
Stock yards.....	10
Live-stock exchanges.....	11
Rules of stock yards.....	11
Selling stock in yards.....	13
Inspection of stock.....	15
The abattoir and packing house	18
The abattoir	18
Packing-house methods.....	19
The market classification of livestock.....	21
Basis and objects of classification.....	21
Horses and mules	23
Cattle	24
Hogs	26
Sheep	27
Shipment of stock by railway	28
Bills of lading and releases.....	28
Charges for transportation	29
Stock cars	31
Making a shipment.....	33
The export trade	35
Importance of foreign markets	35
Inspection regulations	36
Regulations for stabling and care on vessels.....	37
Methods and practices.....	38
Expenses and losses	40



MARKETING LIVE STOCK.

INTRODUCTION.

The production of animals is only a part of the stockman's work. In order to secure the best results he must study markets and the methods of marketing; he must learn what classes and what grades of stock find the readiest market at the highest prices, and he must endeavor to produce stock of such classes and grades, and, finally, he should keep posted on the condition of the market so as to sell his animals for all they are really worth.

The marketing of live stock involves a rather wide range of knowledge. In this bulletin the object is to present some of the simpler phases of the subject, in the hope that the information given may be of interest and use to those whose experience in marketing live stock has been more or less limited. The treatment of the subject is intended to be such as will give a fair knowledge of essential facts regarding markets and methods of shipment and sale.

A market is a place where two or more persons come together to exchange commodities or to buy and sell. The most complex form of modern live-stock market is illustrated in the great Union Stock Yards of Chicago, where nearly 50,000 people are engaged in work more or less associated with the marketing of live stock. In markets of the same class in different sections methods of doing business differ somewhat, but in certain essentials they have much in common. The chief differences are in market classifications of the stock and in the prices quoted. As a rule the larger the market the more numerous are the recognized classes and grades of animals and the wider the range of prices quoted.

BUYING AND SELLING IN COUNTRY DISTRICTS.

The traveling buyer.—The simplest method of disposing of animals prepared for market is that in which the buyer visits the producer, examines the stock, and gives the producer an opportunity to make a sale. In the more densely populated farming sections local butchers and stock buyers travel through the country looking for stock. These buyers, as a rule, purchase stock at prices which are below current market quotations, in order to allow for shrinkage and expenses

connected with delivery. They may also endeavor to drive hard bargains with producers who are at a disadvantage in any respect, as, for instance, in knowledge of market conditions or in the quality and quantity of the stock they may have to sell. Underfed or low-grade stock will find a purchaser who will raise objections to its quality and fitness for market or slaughter, and who will demand a maximum of accommodation in the handling and delivery of the stock.

The buyer may or may not require delivery to the local slaughterhouse or stock yards, much depending on the demand of the market for the class of stock sold. Some feeders sell rather regularly to the same buyer, a plan which has some advantages for both buyer and seller. If the buyer feels quite certain of obtaining well-finished animals which he can use to advantage, he will be likely to make liberal concessions in regard to the disposition of the stock after sale; and the stockman finds it more convenient, as well as agreeable, to sell to a man with whom he is acquainted, in whom he has confidence, whose methods he understands, and on whom he can call whenever he is ready to sell.

Local butchers, as a rule, can not make large purchases, but buyers for shipment can usually handle large numbers of animals, especially if they are of high grade. Occasionally such buyers can select animals for export which may be shipped from the farm direct to the coast. Such stock will command relatively high prices.

Seeking a buyer.—If the producer is not visited by a dealer, or for some reason he prefers not to sell to a traveling buyer, he may go to the local butcher or to a buyer located at a convenient shipping point and try to make a sale. If he lives in a locality favored with special market days, he may drive his stock to the market and risk the making of a good sale. If he has but a few head of calves, hogs, or sheep he may carry them to market in a farm wagon with high side-boards, or in one fitted up with a crate built for the purpose. Animals hauled to market are of course in better condition and suffer less shrinkage than those which are driven.

Unless the producer carries his stock to a market where he can find several buyers who are in competition, he may have to sell at a disadvantage. If there be a regular periodical market where sellers and buyers are in the habit of meeting, the seller is more likely to find lively competition and to dispose of his stock advantageously.

PERIODICAL AUCTION SALES.

Auction sales furnish a good opportunity for disposing of stock. Sometimes a special country auction sale is held to dispose of the surplus stock of a local breeder; or two or more such breeders may combine to hold such a sale. In such cases the arrangements and

advertising may be left to the auctioneer, who receives a percentage on the sales made and pays for clerk hire, advertising, etc.

But the more important local auction sales are those which are held periodically at some point which is convenient for both producers and buyers. Such sales are not very common in the United States, though they have been established in a few places in the central West, especially for the disposal of horses and cattle. Such sales are sometimes held on the streets or on the public square of a considerable town, or in some commodious stable. The animals are offered for sale singly or in lots, as the seller may prefer. The auctioneer usually receives either so much per head for stock sold or a percentage of the amount realized by the seller. The cost of advertising such sales is usually nominal, and sometimes no special advertising is necessary, as in case of the monthly stock sales which have been held for many years on the streets of London, Ohio, on the first Tuesday of every month. Payments for stock sold at these periodical auctions are nearly always made on a cash basis.

AUCTION SALES IN GREAT BRITAIN.

The local auction markets held in Great Britain are of considerable importance, and are usually held weekly. Such sales vary in character according to region and conditions. At Kilmarnock, Scotland, periodical sales are held, the stock sold being largely Ayrshire dairy cows and butchers' stock, much of which comes from Ireland. From 100 to 150 cows are commonly sold at each weekly auction. There is a yard with pens for keeping stock for inspection, and two buildings about 40 feet square for conducting the sales. There is in each a sawdust-covered ring, a box for the auctioneer and clerk, and seats arranged in amphitheater style for the bidders. Each cow is entered on the record by a number, and a slip of paper bearing the number is pasted on the rump.

At Kilmarnock the cattle are consigned to the auctioneer, to whom the consignor must look for his pay. No animal is to be taken from the yard until paid for. For remuneration the auctioneer receives about $1\frac{3}{4}$ per cent of the amount of the sales.

These British sales are patronized by dealers, farmers, dairymen, and butchers. All have an opportunity to inspect the stock before the sale. Some of these country local auction sales in Great Britain are very large. At Hereford, England, on each Wednesday, hundreds of cattle change hands, as many as 2,000 being sold in one day.

A TYPICAL LOCAL HORSE AUCTION.

At Orrville, Ohio, for some years a horse company has conducted sales twice a month. The horses are brought in from the surrounding

country and are offered for sale in a building constructed for the purpose, containing many stalls, a sales room, auctioneer's and clerk's box, and seating space for buyers. These sales are attended by local buyers and men from a distance who come to secure stock for special orders.

The following are the rules of this company for 1903, as published by them:

Rule 1.

Terms of sale.—On all sales for less than \$10, cash payment will be required, unless otherwise notified by the auctioneer. On all sales of \$10 or over, a credit of four months will be given upon notes drawing 7 per cent interest, with approved securities. A deposit of \$10 must be paid at the time of purchase, unless parties are known, and balance before removing property. No stock will be allowed to leave the premises until satisfactory settlement has been made with the clerk. If horses are not removed on day of sale purchaser will be charged at the rate of 50 cents [each] per day until removed.

Rule 2.

Guaranties on horses sold shall expire on the following Monday at noon. When horses are not as represented, and can not be returned within the limit of the guaranty, the purchaser shall telephone or telegraph to that effect, and such notice will be recognized, and notes or money will be refunded. No horse will be taken back on account of a splint.

Rule 3.

Purchasers of consigned horses will take notice that the owner is the only responsible party, and that the proprietors simply act as his agent. It is the duty of the buyer to inquire as to the conditions upon which the sale is made, and upon his failure to do so, should the conditions upon which the horse is sold (as announced by conductor of sale or auctioneer) be different from the buyer's understanding, it will be no cause for rejecting the same. The —— Horse Company will not be responsible in case of fire, accidents, or sickness, all stock being at owner's risk. Consignors who misrepresent vicious horses, such as kickers or runaways, will be held responsible.

Rule 4.

All consigned horses should be examined and tried by purchasers as soon as bought, and their wind and work must be tried and accepted or rejected on the premises. A horse sold to be sound, proving to be a cribber, a heaver, crampy, or lame, can be rejected within the limit of the guaranty. In case of a dispute between the buyer and seller as to points of unsoundness, the matter shall be referred to a duly graduated veterinary surgeon, whose decision shall be final. Age and weight of horses are not guaranteed. Consigned horses are paid for by cash or check, less commission and feed, at the expiration of the guaranty.

Rule 5.

All horses should be at the stables the day previous to the sale. A commission will be charged on all horses entered, whether sold at auction or private sale. **Rates of commission:** Home consigned horses, \$3 per head; western horses, \$5 per head; feed, 50 cents per day; single feed, 25 cents.

RULES AND METHODS IN CHICAGO HORSE MARKET.

The great prominence of the Chicago horse market gives special interest to the methods and rules governing sales therein. The following information, based on the practices of the market, is quoted from the Drovers' Journal:

A horse negotiated at the halter is sold as he stands; all imperfections, blemishes, and unsoundness go with him. He is sold without recommendation and the title only is guaranteed.

A horse sold for a worker only must be a good worker, and all imperfections go with him.

A horse sold sound must be so in every particular; free from vices and able to pass a perfect veterinary examination.

If wind and work are guaranteed, the horse must be sound in wind, a good worker, not a cribber or heaver, and everything else goes with him.

A horse sold serviceably sound must virtually be a sound horse for all useful purposes of his class. He must be perfect in eyes, wind, not lame, not a cribber, and must be able to do as much work as a perfectly sound horse. He can be serviceably sound and be a little rounding on the curb joint, but not curbed or branded. He can not be scarred from fistula, or have hip down, but may be slightly cut out at the knee, or puffed a little about the ankle. He can not have scars or blemishes that constitute deformities, or blemishes and scars that deteriorate his value more than a trifle, or that in any way impair his usefulness for work. Car bruises must be of a temporary nature.

The prices quoted in the horse auction reports are for horses sold on the block to the highest bidder. The sales made at retail are not published unless they are for extra choice animals that sold considerably above the regular auction quotations. Domestic and foreign buyers carefully inspect all the arrivals as soon as reported, and as many animals as possible that will fill their orders are purchased privately, dealers preferring this method, as it gives them more time to examine and try their purchases than can be accorded where horses are sold under the hammer. Horses sold at private sale generally command better prices than if sold at auction, although there are many exceptions to this rule, the spirit of the bidder creating competition, and buyers, relying on one another's judgment, bid the offering up.

All kinds of vehicles and appliances are at hand to show horses according to their several uses, either as drafters, drivers, or saddlers, and all sales are void if the animals fail to perform according to the recommendation.

The animal sold must have all the qualities named by the auctioneer at the time of the sale. Any horse falling short of the recommendation on which he is sold can be rejected, but the purchaser must examine and try the animal within the time specified in the rules.

The rules of the exchange require the payment of a uniform price of 60 cents a day for feed charges on horses sold in the market. No

charge is made for watering, bedding, and grooming. If the horse's tail is to be soaked, or tail and mane braided, extra pay must be given to men not in the employ of the stock-yards company.

PROMINENT METROPOLITAN MARKETS.

The prominent domestic live-stock markets of the country have extensive stock yards where many thousands of animals are received from over a wide territory. Here buyers and sellers have large opportunities to pursue their trade, and such markets usually are extensive consuming points, and have large packing houses and good shipping facilities.

Principal live-stock markets of the United States.—The largest domestic markets in the Mississippi Valley are the following, as shown by the 1902 receipts of live stock at the stock yards of those cities. Of these, Chicago is not only the most important American market, but also the greatest live-stock market of the world.

Receipts of live stock at the stock yards of the leading United States markets for 1902.

City and State.	Horses and mules.	Cattle.	Sheep.	Hogs.	Total.
Chicago, Ill.....	a 101,555	2,935,495	4,515,072	7,891,728	15,443,850
Omaha, Nebr.....	42,079	1,010,815	1,742,589	2,247,428	5,042,861
Kansas City, Mo.....	74,272	2,062,814	1,138,125	2,241,772	3,215,211
St. Joseph, Mo.....	19,909	494,016	560,658	1,697,781	2,772,309
St. Louis, Mo.....	a 109,295	1,112,942	523,201	1,329,819	1,745,438
Indianapolis, Ind b.....	a 35,779	213,179	102,580	1,251,351	1,602,889
Sioux City, Iowa.....	18,416	387,217	59,697	992,273	1,457,603
Cincinnati, Ohio.....	8,699	194,859	410,148	664,734	1,278,440

*a*These figures are for horses only.

b Union Stock Yards.

Denver, Fort Worth, Pittsburg, and Buffalo also have very important live-stock markets.

STOCK YARDS.

Organization and location.—Stock yards in different cities are organized on the same general lines. The ownership and control is vested in an incorporated company, in many cases the name Union Stock Yards Company being adopted. This company usually owns the land the yards cover, or controls its use. Frequently the shares of stock in such yards are owned more or less largely by the railway companies that have tracks in or alongside these yards. The yards are usually located in the suburbs of the cities, owing to the considerable space they occupy. Those of Chicago are about 4 miles southwest of the heart of the business section; those of Omaha are in the southern suburbs; those of Buffalo some miles east of the city; and those of Boston at Brighton, 5 miles west from the city. The yards are located so as to be easily penetrated by the various railways engaged in live-stock transportation.

Arrangement of stock yards.—The space devoted to yards is divided into sections and blocks, after the manner of laying out a town site. There are main drives and alleys, with the space between filled with stock houses and pens. A live-stock exchange usually occupies a prominent and convenient situation in the yards. Packing houses and other buildings associated with the trade may also be located in the yards, or on land adjoining. Each class of stock is usually grouped in buildings or pens more or less restricted to its kind. The horse barns are always separate and not in the main inclosure. Cattle, sheep, and hogs may be under the same roof, yet in different sections and pens.

The pens used for handling stock are supplied with feed boxes and running water. Lines of railways switch alongside or into the yards, and one or more cars, or an entire train load, may be quickly unloaded on a receiving platform alongside the pens.

LIVE-STOCK EXCHANGES.

The methods employed in the yards in different cities will necessarily differ somewhat, yet, excepting in minor matters, the customs are much the same. The rules and regulations are provided by the live-stock exchange, which is a branch of the National Live Stock Exchange. A local live-stock exchange is really an organization of dealers in the yards who buy and sell a large part of the stock shipped in. In the exchange building are its headquarters, and here are the various offices of the live-stock commission men. The exchange has a board of officers, consisting of a president, vice-president, secretary, treasurer, and board of directors. There are also committees in charge of certain work of the exchange. The purpose of this exchange, as set forth in the charter of the Chicago Live Stock Exchange, is—

to establish and maintain a commercial exchange; to promote uniformity in the customs and usages of merchants; to provide for the speedy adjustment of all business disputes between its members; to facilitate the receiving and distributing of live stock, as well as to provide for and maintain a rigid inspection thereof, thereby guarding against the sale or use of unsound or unhealthy meats; and generally to secure to its members the benefits of cooperation in the furtherance of their legitimate pursuits.

All persons selling or buying stock in the yards must conform to the rules made by the exchange or by the stock yards company, paying such rates for yardage, feed, or commission as it or they may establish.

RULES OF STOCK YARDS.

Those rules which especially interest shippers relate to the use of the yards, the commission on animals bought or sold, cost of feed, switching expenses, and disposal of sick, injured, or dead animals.

Water is furnished free to all stock in all yards, but the cost for feed varies. The stock yards company furnishes hay and grain at different points in the yard. A person having charge of a consignment of stock in a pen goes to the office of a feed superintendent and fills out a blank form for whatever feed is desired, receiving a duplicate copy of his order. This feed is then delivered to the pens as requested. The charge for feed varies in the different yards of the country. The Omaha yards, for example, charge \$1 per hundred for hay and \$1 per bushel each for corn and oats. In Pittsburg the charges are \$1.25 per bushel for corn and \$1.50 per hundred for hay; in Buffalo they are the same.

In view of the fact that commission charges are important, those adopted by the Chicago Live Stock Exchange on February 5, 1901, are given, as showing something of the character of the charges made to shippers:

Section 1. The commission for selling live stock shall not be less than the following-named rates:

Section 2. Fifty cents per head for all cattle of all ages, up to \$12 per carload; provided, that veal calves in less than car lots shall be charged not less than 25 cents per head; double-deck cars of calves \$18.

Section 3. Six dollars per carload for single-deck cars of hogs or sheep, or hogs and sheep, and \$10 per carload for double-deck cars of the same. When part of a car is double-decked and loaded with hogs or sheep, or both, the commission for selling such fractional upper-deck shall be 15 cents per head up to \$10 per carload.

Section 4. Forty head or more of hogs or sheep, or hogs and sheep, arriving at these yards in a single-deck car, shall not be considered as a mixed car, but shall constitute one carload, to be charged \$6. For stock arriving at these yards in less than carload lots, 50 cents per head for cattle, 25 cents per head for calves, and 15 cents per head for hogs or sheep, under 40 head.

Section 5. The charges for different species of live stock in a single car are as follows:

Cattle per head, up to \$12 per carload, 50 cents.

Calves per head, up to \$12 per carload (single-deck), 25 cents.

Hogs per head, up to \$6 per carload (single-deck), 15 cents.

Sheep per head, up to \$6 per carload (single-deck), 15 cents.

The commission on mixed live stock shall be governed by this section up to a charge of \$12 per single-deck carload, and \$18 per double-deck carload.

When part of a car is double-decked and loaded with hogs, sheep, or calves, the commission for selling such fractional upper-deck shall be at the rates herein established for selling single-deckers of mixed stock.

Section 6. The commission for purchasing live stock shall not be less than the following-named rates:

Stocker and feeder cattle (including calves) per head (but not to exceed \$10 per carload, unless the parties, in connection with a loan or advancement, agree to pay per head, without regard to the number constituting a carload lot)	\$0.50
Stock and feeding sheep and lambs, per single-deck carload	6.00
Stock and feeding sheep and lambs, per double-deck carload	10.00

Severe fines are provided for a violation of the above rules on the Chicago Live Stock Exchange.

Stock-yards companies care for the stock from the time of its arrival until it is disposed of. This usually includes handling, watering, feeding, and weighing. No charge is made for the use of the yards. There is one charge for weighing, usually termed "yardage," which is collected when the stock is sold.

The yardage charges in Buffalo and Pittsburg are 15 cents per head for cattle, 6 cents for hogs, 4 for sheep, and 8 for calves. The Omaha charges are .25 cents for cattle, 8 cents for hogs, 5 cents for sheep, and 10 cents for calves. In Chicago there is a terminal charge of \$2 each on cars coming in over western roads, and \$1 on those coming in over eastern roads. The terminal charges, yardage, and fee charges constitute the main source of revenue of the stock-yards company.

SELLING STOCK IN YARDS.

Unloading the stock.—The stock is driven from the car onto the receiving platform, and from this it is driven by chutes to the pens in various parts of the yards. One may unload a carload of stock, drive it into an alley adjoining the platform, and thence to any part of the yard desired. Cross gates are at frequent intervals, which will permit one to direct his stock at his pleasure with but little trouble. After the stock is placed in pens it is available for sale. The shipper usually turns it over to a commission firm to sell, although this is not a necessity. Yet one not regularly on the market can not sell to as good advantage as can the regular dealers. This is because irregular sellers are not in touch with the buyers, so as to secure a wide range of custom.

The animals received in stock yards usually reach the market very early in the morning, and by noon the active business of the day is about completed.

Buyers and sellers.—There are two classes of men in the yards about the pens, the commission men selling and the buyers. The first thing each morning these men inform themselves regarding the quotations on the various classes and grades of stock and the visible supply. If the supply is short and the demand for certain grades is active, then the buyers seek the salesmen; but if the market is dull and indifferent, then the sellers seek the buyers. Where men buy for the packing houses, they receive a daily statement of the slaughter record of the animals purchased by them the day previous.

The buyer looks over a consignment of stock in the pens after a price has been made him by a salesman. He may accept at the price offered or there may be some sparring over the price, and finally a sale may be made by a nod of head or a wave of hand.

Weighing in the yards.—This takes place at various points, and the larger the yards the greater the number of scales. These stock scales,

each in charge of a weighmaster, have large platforms capable of holding 50 or 60 mature cattle, and have a weighing capacity up to 100,000 pounds.

The animals are driven from the pen to the scales soon after the sale. The weighmaster, who is an employee of the yards, does the weighing, and a representative of the commission firm also takes a reading from the beam. A scale ticket is then made out which gives the number of animals and the weight, and the names of the buyer and commission firm making the sale. Four copies of the scale record of each draft of animals are made by the weighmaster at one writing by a duplicating process. One record is made in his permanent record book; another, consisting of a detachable copy for the use of buyers' helpers at the scales, which is placed on file for inspection, while third and fourth copies are issued, respectively, to buyer and seller. One of the latter serves as a certificate to adjust the buyer's accounts and the other the seller's.

All animals should be counted on leaving the scales and, if not taken in charge at once by the buyer or his representative, are placed in pens and locked in. Authorized commission men are usually at the scales to look after the weighed stock. After weighing, the stock may be delivered to any point desired, as, for example, to a packing house or to a stock car, or they may be driven out of the yards.

Methods of settlement.—Banking facilities are found in all prominent stock yards in one or more organized banks of well-established credit. In view of the fact that the business of the yards is transacted on a cash basis, a bank is very helpful to the great business interests of the yards.

Methods of settlement in stock yards may differ in minor details in different cities, but in general they are much the same. After the stock is weighed the weighmaster's certificates, showing the number and weight of the animals sold in each case, are delivered to the seller, whether the owner of the stock in person or his commission agent. If to the latter, a bill is sent to the purchaser, comprising a duplicate of the scale record, with the selling price of the stock, and the amount of the bill. The buyer of the stock indorses the bill and returns the duplicate to the commission agent with an order—perhaps on the back of the bill or may be by check—on a bank to pay the commission firm this sum of money. With the payment of the order or check it returns to the buyer as an accepted check, serving as a complete receipt and voucher, showing the entire course of the transaction. This includes an exact duplicate of the weighmaster's certificate, the commission man's indorsement, and the bank's stamp giving date of settlement.

It is customary for the commission agent, even before settling with the buyer, to send to the shipper, if nonresident and not otherwise

represented, a statement of the gross proceeds of the sale, with deductions for freight, commission, yardage, etc., and to forward him the balance due. The payment is of course usually made by means of a bank draft or check, according to local conditions. Such negotiable paper is equivalent to cash.

INSPECTION OF STOCK.

Government supervision.—The Bureau of Animal Industry of the United States Department of Agriculture by authority of Congress takes charge of the enforcement of all National laws relative to diseased live stock and its control. The Secretary of Agriculture is empowered to issue from time to time regulations for live-stock inspection, quarantine, and slaughter. Live-stock commissioners or State veterinarians and boards of health supervising State live-stock interests are also expected to cooperate with the Bureau of Animal Industry.

In 1903 cattle, sheep, calves, and hogs and their products were inspected at 156 abattoirs and packing houses, located in 50 cities of the United States. Inspections were also made of the live stock and meat contents of vessels engaged in the export or import trade.

In those markets subject to Government supervision a trained veterinarian has charge of the inspection, and associated with him is one or more inspectors, as the case may be, the number depending on the size of the market. Not only do United States inspectors officiate, but in some cities, like Chicago, representatives of both city and State also inspect. City inspectors are used only for the inspection of meat to be consumed in the city where the yards and abattoir are located. The inspectors of the State board of live-stock commissioners (or similar office with some other name) are mainly interested in seeing that no animals suffering from disease shall enter the market and be allowed to contaminate the healthy stock of the State. The United States inspector deals with the subject in its broadest sense, as affecting inter-state and international trade. The live-stock exchange at the yards, including as it does the commission men, cooperates with the Government to promote as high a standard of health in herds and flocks as it is possible to obtain. Every person who does business in the yards is under strict obligation to obey all the rules and regulations issued by local, State, and National governments.

Cattle originating in the section of country infested by the ticks of the species which causes Texas, or splenetic, fever may be shipped out of that quarantined district only in accordance with the regulations of the Department of Agriculture; and, except for a short period during the winter, they may be shipped only for immediate slaughter.

Importance of inspection.—The importance of a strict enforcement of these laws can hardly be overestimated. The export trade in live stock

and dressed meats amounts to many million dollars per year. Foreign governments will prohibit the entrance of American meats into their markets if it is found that they are diseased. In 1881 Germany, France, and other European countries prohibited the entrance of our pork into their markets, claiming that it was affected with trichinæ. We sold to France and Germany alone 113,000,000 pounds of pork in 1880. Later Great Britain refused admission to our cattle and sheep on the ground that they were diseased. This resulted in the adoption by the United States Government of rigid measures to protect our live-stock interests by aggressively combating all known cases of contagious disease, and finally adopting systematic inspection at the leading centers of live-stock shipment and consumption. This inspection increased from 12 cities and 28 abattoirs in 1892 to 52 cities and 157 abattoirs in 1901. To-day no government in the world exercises more careful supervision of the healthfulness of its meat supply than does the United States of America. Not only have inspectors done their work in this country, but trained American veterinarians are stationed abroad to take observations on the condition of American live stock and meats as received in the great ports of Europe.

Inspection in the yards.—Soon after the receipt of animals in the yards they are inspected by a veterinarian. Animals suffering from a disease or injury which makes them unfit for food are condemned to the rendering works. The same applies to animals which arrive at the yards dead, as occurs daily with hogs and sheep, and occasionally with cattle. Animals in poor condition and under suspicion as unfit for food are marked with metal tags in the ears, and are placed in special pens for further observation or slaughter. These animals are slaughtered under the supervision of attendant veterinarians, and records are made of each case. In cases of animals which are out of form in some respect, yet not unfit for food, the meat is sold to local buyers. In the yard inspection it may happen that some animals fall under suspicion that will later be allowed to go with the passed animals as being salable on open market.

Cows within a month of parturition, and for ten days after, will be subject to condemnation. In the slaughterhouses the meat of all cows that have calves inside with the hair on is condemned. So also are all pregnant sows near parturition, hogs with bunches, boils, cuts on hams and shoulders, etc. "Bob" or "deacon" calves are condemned, and also sheep emaciated and in bad condition.

The live-stock exchange holds itself responsible for the disposal of condemned animals, and after deducting cost of the service, pays to the owner of the condemned animal whatever balance may come to his credit. No animal is a complete loss, as the fertilizer and soap factories can use the lowest grade of flesh.

Such live animals as pass the inspectors must also be inspected during the operation of killing and dressing. Several inspectors are found in each of the largest packing houses, and they are constantly discovering cases that escaped detection on foot, which show by diseased internal organs that they should not be used for food. Hogs suffering from cholera are a good example of this. In 1903 in post-mortem inspection United States inspectors condemned 19,256 carcasses of hogs found to be suffering from cholera, while 8,598 cattle carcasses were condemned as being tuberculous. Every condemned carcass in the slaughterhouse is at once tagged with a special tag, showing it to be condemned. This may be subjected to further scientific examination or may at once be ordered to the rendering tanks.

Microscopical examination.—For some years the Bureau of Animal Industry has conducted extended microscopical examinations of pork in many stock yards. Three pieces of flesh from different parts of the muscle of the hog are placed in numbered labeled tin boxes, the numbers corresponding with the number of the carcass inspected. Then each sample is crushed flat between two glass plates and placed under the microscope. In 1903 there were examined in the United States by the Bureau of Animal Industry 489,667 carcasses of hogs. The results of this examination may be expressed as follows:

	Carcasses.
Class A. Free from all appearances of trichinæ	477, 195
Class B. Containing trichina-like bodies or disintegrating trichinæ	7, 394
Class C. Containing living trichinæ	5, 078

In 1903 there were 5,136 trichinous carcasses disposed of, weighing in excess of 1,000,000 pounds. Government certificates are attached to all the pork for export, showing it to be healthy.

Dipping animals.—Dipping for external parasites on live stock is also enforced by both State and national law. Sheep scab, a contagious parasitic skin disease, works great ravages in the flocks of this country where not properly cared for. Wherever sheep thus diseased go they leave traces of the scab and cause its transmission to healthy sheep. The severity of this trouble has resulted in requiring all sheep at the yards sold for feeders to be dipped under Government supervision before being shipped therefrom. In 1901 there were dipped under Government supervision 1,034,398 sheep. Some of our States have also enacted laws requiring stock sheep to be dipped under shipping conditions before passing from the local yards. Laws also prohibit sheep coming from one State into another without being properly dipped and certified to.

All animals are inspected, including horses, since glanders and other contagious diseases are frequently discovered. In such yards as those at Chicago an inspector stands at each gate to pass on every animal

going through. Even if an animal in unfit condition passes free of suspicion at first entrance, the chances are that subsequent inspections will result in its discovery. In the western stock yards "brand inspectors" are employed to inspect for stray branded cattle that have been lost or stolen from the range. Such animals may be sold and the money turned over to the owner whose brand in each instance is known.

Docking.—Docking is more or less practiced in all live-stock buying for animals of certain kinds, and especially so in the more exacting city trade. All pregnant sows and also sows that have once had pigs but are not pregnant at sale are docked. Stags are also docked. For example, in the Indianapolis yards pregnant sows are docked 40 pounds and stags 80 pounds. In a small local yard the writer has had old breeding sows not pregnant docked 30 pounds. In some localities old sows are docked 50 to 75 cents per hundred and stags \$1.

THE ABATTOIR AND PACKING HOUSE.

While the slaughter of animals and the disposal of the meat are not involved in the marketing of live stock, they are closely connected therewith, and will, therefore, be given brief consideration here.

THE ABATTOIR.

Abattoirs or slaughterhouses vary in their equipment and capacity for work from the small local one to that of the great packing houses of the large cities. In the one case only a few animals are killed to supply a local consumption; in the other thousands of animals are killed daily and their parts are distributed among the markets of the world.

In this country men in small towns usually either buy their meat at wholesale from the agent of some nonresident packing house, or they slaughter in a small way, in some sort of a barn-like structure on the outskirts of the town. Small combined slaughter and packing houses occur in small cities. In some cases the firm owning the building will, for a certain consideration, permit other butchers to slaughter their stock at so much per head or for a regular annual rental. Such an establishment will have more paddocks than common for one butcher, and will also have greater floor space than would be necessary in a small city for one firm.

Cattle, sheep, and swine in America are usually slaughtered by cutting the throat. Cattle are first stunned by a blow on the frontal bone of the skull from a long-handled heavy hammer, which fells them, after which the throat is cut. Sheep are seized by the hind legs and are suspended to hooks, which are stuck through the leg above the ankle between bone and sinew, after which the throat is cut as the

animal hangs. Hogs have the jugular vein cut by a quick movement of the knife.

The general plan after killing is to remove the skins of cattle and sheep or hair of swine as soon as possible after death, after which the internal organs are removed by making an opening from throat to vent, laying the entire body cavity open for removing the parts. In the great packing houses of to-day, and in some cases even in small, local slaughterhouses, everything is saved and sold for some special purpose.

PACKING-HOUSE METHODS.

The largest packing houses in the world are situated in the Union Stock Yards at Chicago.

Methods with cattle.—The cattle enter the slaughterhouse from the yards through a narrow chute leading into the “knock-out” pens, which consist of a long narrow room, wide enough to hold two cattle abreast. When two steers reach the end of the room, a wooden partition is let down behind them, and in front of the pair back of them, and in this way throughout. From four to ten pens are thus used. Men known as “knockers” or “stunners” stand on planks overhead and strike the animals deadly blows on the head, when they drop to the floor stunned. One side of the stall is then raised, the floor is tilted by means of a mechanical arrangement, and the animal rolls out onto a shackling floor. Here a man places a chain about the hind legs and hooks it onto a chain suspended from a traveling pulley. By machinery the animal is then hoisted until the head clears the floor and is carried along, suspended from an overhead track, until it reaches the “sticker.” Here a man cuts the throat, doing about 425 an hour. Then begins a journey of dismemberment for the carcass, which passes through a line of men each with a specific work to do on the carcass or entrails, until the cooler is reached. So systematically is the work of dressing the carcass done that miscuts or injuries to any animal or part can be at once traced to the employee doing the damage. This is the case with all the animals slaughtered, no matter whether cattle, sheep, or swine.

Methods with hogs.—The hogs are driven into slaughter pens and run beneath hoisting wheels 10 feet in diameter, operated by machinery. In the pen a shackle places a chain about the hind leg of a hog and hooks him to one of six chains hanging at equal distances apart from the rim of the hoisting wheel. The animal is hauled up by the slow revolution of the wheel and descends on the opposite side, when the chain about the leg catches on a “sticking bar,” which liberates the hog from the wheel and slides him onto a rail, from which, by gravity, he gradually moves into the sticking pen. The hogs here come into the hands of a man who, with a knife, sticks about 10 a minute. From the sticker they pass on to the scalding vat, into which they are

dropped free of the shackles. The bristles on the hams, shoulders, and back are removed by hand, after which the carcass is carried up through an automatic hog-scraping machine. After scraping, the body is beheaded, following which comes the cleaning of entrails, general dressing, and placing in the cooler.

Methods with sheep.—In the sheep pens boys fasten a chain to the hind legs of two sheep, which is attached to a triangular link and hooked into a hoisting chain, which is raised and lowered by electricity. The hoister transfers the sheep to a traveling pulley on a track slightly inclined downward, along which they move to the sticker, who cuts the throats of from 500 to 600 per hour. The sheep pass beyond the sticker to others, who take off the skin and head, remove the entrails, and do the other work necessary before placing the carcass in the cooler. In the sheep house they have what is called an operating ring, which is a line of racks on which the carcasses are hung while being dressed. Operators travel about the ring in regular order and complete the work of dressing, after which the carcasses are placed in the cooler.

All slaughtered animals are inspected during the process of killing and dressing by a representative of the Bureau of Animal Industry. They are also inspected and officially tagged in the cooler.

Cold storage.—The large packing houses have immense cold-storage plants, in which thousands of carcasses can be hung on overhead hooks. These cold rooms are arranged in sections, with varying degrees of temperature. The warm carcass is placed in a room only moderately cold, where it remains for some hours to chill, after which it is moved into a room having a lower temperature, and finally to one with a temperature of about 38° F. One of the packing-house companies of Chicago states in a circular that its coolers hold about 13,340 sides of beef, 17,000 hogs, and many thousand sheep.

Uses of waste products.—Strictly speaking, there is no waste in the up-to-date packing house. The following are some of the uses made of those parts of the animal that can not be regarded as dressed carcass. Horns are converted into combs, buttons, and handles, and are used for making fertilizer and glue. The better grades of hoofs are useful in making knife handles, buttons, and fancy articles, the inferior grades going into fertilizers. The foot also yields neat's-foot oil. The first flow of the blood is used in making albumen, a substance used for holding dyes, making paints, and clarifying sugar. Blood not used in albumen manufacture is converted into high-grade fertilizer. Intestines are largely used as sausage casings; they are also used for shipments of lard, for containing putty, and by gold-beaters. The hides are trimmed, salted, and packed, and later sold to tanners. The bristles of hogs are used for brushes, the hair from cattle for mattresses and cushions,

and the wool from the sheep pelts finds its way into the woolen trade. Even the wash water before being emptied into the sewer is surface-skimmed for the removal of all grease, which is used in the soap factory. Last but not least, the fertilizer works, now connected with all large packing houses, consume a large amount of definite or indefinite material which is made into fertilizer or forms of animal food.

Superiority of American methods.—No phase of our great live-stock interests has been reduced to such a systematic basis as the modern metropolitan packing house. The conditions are on a high plane of sanitation, cleanliness, and health. European methods of killing and dressing stock are fifty years behind those of the United States, viewed from the standpoint of humanity, economy, or system. One only needs to view the old-fashioned and often cruel work in the slaughter pens across the river from Liverpool, England, and in the La Villette yards of Paris, to see a great difference in favor of the methods employed in this country.

Visitors to the Union Stock Yards at Chicago will do well to visit one of the great packing houses in that place, and examine the methods employed. There are six great establishments there, and they make visitors welcome, and furnish them free guides. Some of the houses also furnish printed circulars regarding the extent of their business, with other facts of interest concerning the killing department. The conditions are such that no person need fear the soiling of the dress in going in these places.

THE MARKET CLASSIFICATION OF LIVE STOCK.

Live stock of all kinds is arranged in the market into classes and grades. These vary more or less according to the market, and even in the same market they are not always the same.

BASIS AND OBJECTS OF CLASSIFICATION.

A class comprises the animals suited to certain commercial purposes. Within each class are grades of the same, depending on differences in size, quality, and condition. At the present time the market classifications are not satisfactorily established. This is because those who establish and use the more or less elastic classification make no systematic effort to adopt any fixed standards that shall be generally accepted. It is highly desirable that definite classes and grades be established, for several reasons, among which are the following:

First. That buyers and sellers on the market may transact business on a uniform basis.

Second. That country customers may not have to familiarize themselves with more than one set of standards to properly comprehend market quotations.

Third. That the press may publish uniform and reasonably consistent live-stock quotations.

There may be but a slight degree of variation in the grades on occasions when they closely approximate and merge into one another, but even this should not work to the prejudice of such a classification.

In general, all over the United States in the different markets, live stock is classed according to its special adaptations, and each class is graded largely on the basis of size, quality, and flesh. A meat-producing animal of high grade, whether cattle, sheep, or swine, must have these essential qualifications: Form blocky, the back broad and level; hind quarters square and full on top and thick through the thighs; the shoulders smooth and well set back into the body; the chest broad and full; the neck small and short, with a head of medium size, graceful in outline, with prominent quiet eyes, broad forehead, and large nostrils; the body deep and full in outline, supported by short legs with strong fine bone. A fattened animal of this class should have the framework of the body smoothly covered with meat, so that it will feel firm yet mellow to the touch. The coat of hair should be fine and silky, with a glisten which shows quality, and, in case of cattle, the skin should feel soft and elastic in the hands.

A matured, well-fleshed animal meets the highest market demand when it most nearly approaches the character just outlined. The more deficient the animal is in conformation (as for example in spring of rib, heart girth, length of leg, etc.) and quality, the lower it will grade in its class. In a general way the grades in each class may be designated as prime, choice, good, medium, and common. Market quotations may not on all occasions make use of these terms, for the reason that animals of some grades may be lacking. For instance, the market for one day may offer no prime steers, choice being the best grade. Still, it is rather difficult to draw the line between these two grades. Each represents a superior product, and an animal might be prime on one market and choice on another. Usually with meat stock within a certain class the highest grade animals weigh the heaviest, although this is not always the case when differences in age are considered.

Horses, cattle, sheep, and swine, are differently classified and graded. The grades, however, of prime, choice, good, medium, and common may readily have an application to any kind of stock. The market classifications which follow fairly illustrate the practice in American markets. Those of Chicago have the greatest application, as they affect by far the largest trading community. Those of Indianapolis and Pittsburg are given to illustrate the practice in other markets of importance.

HORSES AND MULES.

All horses may be placed in four groups, in a general way, viz: (1) light, (2) coach or carriage, (3) draft, and (4) pony.

The following is a typical Chicago daily classification, with grades and prices quoted, as given in the Drovers' Journal:

Classes and grades of horses on Chicago market, with prices quoted.

Class.	Poor to fair.	Good to best.
Drafters.....	\$125 to \$175	\$180 to \$250
Loggers and feeders.....	75 135	140 195
Chunks	65 95	100 140
Expressers	110 150	160 185
Farm mares and small chunks.....	50 65	70 110
Light drivers.....	65 135	150 200
Actors and coaches	100 175	200 450
Carriage pairs	250 350	375 700
Western (branded)	12 30	40 55
Plugs and scrubs.....	10 20	25 35
Mules	60 160	165 210

The following represents Pittsburg classification and grades, with quotations, from the Daily Live Stock Journal:

Classes and grades of horses on Pittsburg market, with prices quoted.

Class.	Poor to fair.	Good to choice.
Draft.....	\$100 to \$135	\$200 to \$275
Chunks, farm	70 115	125 175
Drivers.....	90 100	150 300
Coach	70 100	175 250
Carriage teams.....	200 250	250 800
Southerners.....	40 60	60 80
Plugs.....	5 10	15 30

In the above classifications, drafters, loggers and feeders, chunks, small chunks, and expressers, represent animals of a wide range in size, from heavy draft down to small chunks, but in each instance a blocky, drafty form is desired. Farm mares represent a light type of draft, such as farmers often designate "general purpose" horses. Drivers include various light horses, such as trotters, pacers, etc. The thoroughbred and saddle horse come in the light-horse class, but are not strictly drivers. Actors, carriage, and coach horses belong to the one general group. There are other classes introduced, and the terms light, medium, or heavy may be used in reference to each different class of horses and mules. The latter, in fact, are usually graded on size and quality, the larger, taller mules bringing the higher prices. There are consignments of horses of inferior value, classed as Southern, Western, etc., which constantly find their way into the large markets; but they lack quality, size, and training, and those from the range are usually branded. Plugs and scrubs constitute the lowest class on the market.

The relative values of the animals of the different classes are clearly brought out in the prices quoted.

CATTLE.

After an extended study of market cattle in the Chicago yards, Prof. H. W. Mumford, of the Illinois Agricultural Experiment Station, published a classification of cattle, concerning which he gave detailed descriptive notes.^a The following are the general classes as given by him, each of which he subdivides into grades. The brief descriptions of these classes have been condensed from Professor Mumford's notes.

General classes.

(1) **Beef cattle.**—This class includes all grades of fat steers and heifers; also everything from common to prime and from light to heavy. It is finished condition that brings animals into this class.

(2) **Butcher stock.**—This class includes animals that have not fattened well; also animals that have not been fed long enough to become properly fattened. It seldom includes steers of really good quality, as such will usually be sold as feeders. The bulk of butcher stock is made up of cows and heifers.

(3) **Cutters and canners.**—In this class are included old, thin cows and very thin bulls, steers, and heifers. The cutters must carry sufficient flesh to permit of the loin or rib or both being used for cutting on the block. Those animals which are so thin that no part of the carcass can be used for block purposes constitute the canners.

(4) **Stockers and feeders.**—This class includes calves, yearlings, two-year-olds, and older cattle. Cattle 18 months old or older which are ready for immediate use in the feed lot are called feeders. Those which are younger are referred to as stockers.

(5) **Veal calves.**—This includes all calves which are sold for immediate slaughter.

Special classes.

The above general classes really comprise everything in the way of cattle sent to the markets. But there are a number of special classes^b generally recognized which require to be named and defined.

(1) **Texas and Western range cattle.**—A few years ago the typical Texas steer had very long horns and long legs, was thin and narrow-bodied, and carried a large deep brand; and most of the cattle which came from Texas were of this description. But this type is rapidly disappearing. Animals of the best beef breeds have been imported into the State and used for breeding purposes, especially for crossing with the native stock, so that now many of the Texas cattle compare favorably with those from other sections of the country. There is, however, a very wide range between the best and the poorest.

The Western range cattle are classed with the Texas cattle, because formerly they were made up largely of Southern cattle which were driven northward to winter on the ranges north of the quarantine line. Now, however, a large percentage of the animals in this class are bred on the ranges of the West and Northwest.

All the cattle in this class are branded.

^a Bulletin 78, Illinois Agricultural Experiment Station, July, 1902.

^b The first two of these special classes are given by Mumford as "subclasses" and the others as "miscellaneous."

(2) **Distillers.**—These are cattle that have been fattened on the by-products of distilleries. Formerly only inferior grades of cattle were purchased for feeding on distillery residues, but at present many feeders of better grades are used. When sent to market these cattle are preferred to others of the same grade, because they dress out a higher percentage of beef.

(3) **Baby beef.**—This term is applied to choice or prime fat steers between 1 and 2 years old, weighing from 800 to 1,000 pounds.

(4) **Export cattle.**—The cattle exported are in the main good to choice steers, weighing from 1,200 to 1,500 pounds. Comparatively few prime beef steers are bought for export, because of the high price they bring in the home market.

(5) **Shipping steers.**—This term applies to the animals purchased in the western markets for shipment to the large eastern markets of the United States. They are mainly of medium and good grades and range in weight from 1,150 to 1,600 pounds.

(6) **Dressed beef cattle.**—This class includes such cattle as are purchased by the large packing concerns of the Middle West. The packers prefer medium to choice steers, weighing from 1,200 to 1,400 pounds, to make up the bulk of their purchases, but conditions of supply and demand cause them to purchase animals of a much wider range in grade and weight, the extreme range in weight being from 800 to 1,700 pounds.

(7) **Stags.**—This class includes such animals as have reached or at least approached maturity before castration, and hence have the general conformation of bulls. Comparatively few of these come to the general markets, and they are of a wide range in quality, condition, and weight. A few are good enough for export, while the poorest must be sold for canners.

Market quotations, however, are not made on the basis of this classification, and the terms of the different markets differ, as will be seen in the following, quoted from what are essentially the official drovers' journals of the yards. Lists of representative sales are often given with each class. The following are the classes, grades, and quotations in Chicago and Indianapolis, as given by the Weekly Live Stock Report and the Indianapolis Daily Live Stock Journal for October 2, 1902:

CLASSES AND GRADES OF CATTLE ON THE CHICAGO MARKET, WITH QUOTATIONS.

<i>Native beef steers.</i>		<i>Butcher stock</i> —Continued.	
Choice to extra prime....	\$5.80 to \$6.20	Good to choice cows..... \$2.75 to \$3.30	
Good to choice steers	5.40 5.80	Medium to good cows.... 2.35 2.65	
Medium to good steers...	4.00 4.50	Cutters 2.15 2.25	
Common to fair steers ...	3.40 3.90	Cannery 1.50 2.00	
Good to choice corn-fed yearlings	5.50 5.90	Export bulls 3.75 4.40	
Fair to good corn-fed year- lings.....	5.00 5.40	Butcher bulls 3.75 4.15	
<i>Butcher stock.</i>		Half-fat bulls 3.25 3.50	
Fair to choice stags	\$4.00 to \$4.65	Bologna bulls 2.25 2.50	
Common to fair stags	3.50 4.00	Good to choice veal calves. 7.00 7.50	
Extra prime heifers.....	3.90 4.90	Common to good veal calves..... 6.00 6.75	
Good to choice fed heifers.	3.25 3.80	Heavy veal calves 3.50 4.25	
Fair to good fed heifers ..	2.75 3.15	<i>Texas cattle.</i>	
Extra prime cows	3.40 4.00	Good to choice steers \$3.50 to \$4.50	
		Fair to good steers..... 3.25 3.40	

CLASSES AND GRADES OF CATTLE ON THE CHICAGO MARKET, WITH QUOTATIONS—cont'd.

Texas cattle—Continued.

Common steers.....	\$2.90 to \$3.25
Good to choice heifers	2.35 2.75
Fair to good cows and heifers.....	2.15 2.25
Common and medium grades.....	1.75 2.00
Fair to good bulls.....	2.10 2.75

Stockers and feeders.

Good to choice native feed- ers, 900 to 1,100 pounds.	\$3.75 to \$4.25
Good to choice native stockers, 500 to 700 pounds	3.50 4.00
Medium to good stockers and feeders	3.25 3.75
Common to fair stockers and feeders	1.50 3.00

Stockers and feeders—Continued.

Fair to choice feeding heifers.....	\$2.50 to \$2.75
Common feeding heifers	2.25 2.40
Fair to good stock and feeding bulls	2.65 3.00
Common feeding bulls	2.25 2.50
Selected steer calves	4.25 4.50
Stock calves.....	3.00 3.50

Milkers and springers.

Good to choice milkers and springers, per head.....	\$47.00 to \$70.00
Fair to good milkers and springers, per head..	40.00 45.00
Common to fair milkers and springers, per head	30.00 37.50

CLASSES AND GRADES OF CATTLE ON THE INDIANAPOLIS MARKET, WITH QUOTATIONS.

Good to choice steers, 1,350 pounds and up- ward	\$4.75 to \$5.25
Plain fat steers, 1,350 pounds and upward ..	4.40 4.90
Good to choice, 1,200 to 1,300 pound steers ..	4.50 5.00
Plain fat, 1,200 to 1,300 pound steers	4.25 4.65
Good to choice, 900 to 1,150 pound steers ..	3.75 4.50
Plain fat, 900 to 1,150 pound steers	3.50 4.00
Choice feeding steers, 1,000 to 1,100 pounds ..	3.60 3.75
Good feeding steers, 900 to 1,100 pounds.....	3.35 3.50
Medium feeding steers, 800 to 900 pounds	3.00 3.25

Common to good stock- ers	\$2.50 to \$3.25
Good to choice heifers ..	3.65 4.35
Fair to medium heifers ..	3.25 3.50
Common to light heifers ..	2.50 3.00
Good to choice cows....	3.40 3.75
Fair to medium cows ...	2.75 3.25
Canners and cutters.....	1.50 3.00
Prime to fancy export bulls	3.50 3.75
Good to choice butcher bulls	2.75 3.25
Common to fair bulls ..	2.00 2.50
Veal calves	5.50 7.00
Heavy calves	3.00 6.00
Good to choice milch cows and calves	35.00 50.00
Common to medium milch cows and calves ..	20.00 30.00

Pittsburg classes and grades are quite similar to those of Indianapolis.

These market classifications and quotations are somewhat self-explanatory, and materially inform one as to the character of the day's market. These classifications will vary somewhat according to the daily receipts, which may include distillery or export steers or some other class.

HOGS.

The market does not provide so wide a classification of hogs as of cattle. They are largely classed on weight and quality, as is seen in

the following classifications and quotations at Chicago, from the Live Stock Report:

Classes and grades of hogs on Chicago market, with quotations.

Assorted light.....	\$6.30 to \$6.40	Common packers.....	\$5.40 to \$5.60
Good to choice medium weights	6.20 6.30	Pigs, 120 to 140 pounds ..	5.50 6.00
Good to choice heavy....	5.75 6.00	Pigs, 120 pounds and un- der.....	4.50 5.75
Fair to good heavy.....	5.60 5.75	Skips and culs.....	3.00 4.50
Good to choice mixed ..	6.10 6.25	Stags	4.00 4.50
Common to fair mixed....	5.85 6.00		

East of Indianapolis quotations on hogs usually give a class known as Yorkers. These are light weights of three grades, such as are in demand for cutting up on the block in New York City. Heavy Yorkers range from 160 to 180 pounds; medium, from 140 to 160 pounds, and light from 100 to 140 pounds. Pigs of this class grade under 100 pounds.

The grades based on weight will not hold the same in the same market, but will occasionally vary to meet the packers' demands. It may be noted also that on the same date the grades based on weight may differ in different markets.

The price quotations on hogs vary more on weight than quality. The latter feature, of course, always materially assists in securing the highest price, but the demands for weights vary. Sometimes the market quotations are highest on light hogs, and then, perhaps in a relatively short time, heavy hogs command the highest price from the packer. A weight of 225 to 250 pounds for well-fattened hogs will, under average conditions, probably be most in demand.

SHEEP.

The following classification and quotations from the Weekly Live Stock Report of Chicago, representing that market, is about as comprehensive as is published:

Classes and grades of sheep on the Chicago market, with quotations.

Choice Western wethers ..	\$3.75 to \$4.00	Choice heavy native ewes..	\$3.50 to \$3.60
Fair to good Western wethers.....	3.50 3.65	Fair to good native ewes..	3.15 3.40
Choice Western yearlings..	4.15 4.25	Cull native ewes.....	2.00 2.50
Fair to good Western yearlings	3.85 4.00	Choice native spring lambs	5.65 5.75
Choice Western ewes....	3.35 3.50	Fair to good native spring lambs	5.15 5.50
Fair to good Western ewes.....	2.85 3.15	Common and medium lambs	4.50 5.00
Western cull ewes.....	1.50 2.25	Cull spring lambs	3.25 4.00
Choice Western lambs..	5.25 5.50	Feeding sheep	3.35 3.50
Fair to good Western lambs	4.85 5.10	Feeding yearlings	3.60 3.75
Choice heavy native wethers.....	4.00 4.10	Choice feeding lambs ..	4.50 4.65
Choice light native ewes .	3.50 3.60	Fair to good feeding lambs.	4.15 4.40

It will be noted that this classification embraces Western wethers, yearlings, ewes, and lambs, and native wethers, ewes, and lambs. Western sheep are from the ranges of Montana, Wyoming, and other States beyond the Mississippi, and are strongly impregnated with Merino blood. They lack the middle wool or mutton element which is more characteristic of the sheep from States east of the Mississippi. Western sheep and lambs weigh lighter and dress out less fat than Eastern stock.

Buffalo is an important sheep market, and the following is a representative classification there:

Classes and grades of sheep on the Buffalo market, with quotations.

Top lambs	\$5.75 to \$5.85	Fair to good sheep.....	\$3.50 to \$3.75
Fair to good lambs	5.50 5.65	Wethers	4.00 4.25
Cull to common lambs...	4.25 4.75	Yearlings	4.25 4.50
Mixed sheep	3.75 4.00	Export ewes	3.00 3.50

Another classification similar to the preceding in some respects, yet different in others, is on the Omaha market.

Classes and grades of sheep on the Omaha market, with quotations.

Western lambs	\$3.75 to \$5.50	Western yearlings	\$3.20 to \$3.75
Native wethers	3.10 3.35	Feeder lambs	3.30 4.30
Western wethers	3.00 3.80	Feeder wethers	3.00 3.55
Native ewes	2.20 3.00	Feeder ewes	2.20 2.45
Western ewes	2.35 3.50		

These various classes may be extended more or less, by introducing breed or locality classes, and some of slight importance, as bucks for example. The character of the sheep or lambs in each class varies more than the quotations given indicate, for they are graded on a range of quality from common to prime or extra prime.

SHIPMENT OF STOCK BY RAILWAY.

In the shipment of live stock by rail, bills of lading and releases must be made out, charges must be attended to; for long hauls feed must be provided; quarantine conditions may require consideration, and other matters of importance may demand attention.

BILLS OF LADING AND RELEASES.

Whether shipment is made by express or freight a bill of lading is given the shipper, showing date of shipment, by whom and to whom shipped, character of shipment, and rate of charge if desired, unless prepaid. It is customary for bills of lading to be issued in duplicate or triplicate, the consignor receiving one. This he may forward by mail, if desired, to the person to whom the stock is consigned, or it may be retained if the shipper or his agent is to accompany the stock.

If car shipments are made the bills of lading should show the numbers of the cars. This facilitates locating cars in the yards. The bill of lading may serve as a document to secure the release of the freight if one is unacquainted with the local agent at the receiving point. Before taking away freight one must give up the bill of lading to the agent and sign a receipt showing that he has gotten the stock in good condition. Should the stock be injured, however, and negligence on the part of the railway can be proven, damages may, as a rule, be recovered.

Shipments of live stock are usually accompanied with what is termed a "release." A form is submitted to the shipper, which he is expected to sign, in which he supposedly releases the railway or express company from all liability to damage should the shipped stock be injured en route. This release, however, is not so serious as might appear, for if it can be shown that the railway has been guilty of neglect or carelessness, as a result of which stock has been seriously injured, damages may be obtained in spite of the release. Both freight and express companies use the release system.

CHARGES FOR TRANSPORTATION.

Freight or express charges may be prepaid or they may be collected of the receiver of the stock at the other end of the line. In the latter case the shipper must guarantee that the charges will be paid by him if payment is refused by the person to whom he ships. There is no difference in the charges, whether rates are prepaid or not.

Freight rates.—The cost of transportation by freight largely depends on the distance and character of the load. The shipment of one horse or cow, for example, for a short distance will cost much more, relatively, than the shipment of a carload a long distance. For example, a shipment of one cow by freight 50 miles in the Central West will cost about \$6. She occupies a car by herself, and is freighted on the basis of 20,000 pounds, at so much per pound for that capacity. By express she can be shipped at her true weight, the pound rate being higher, and it being necessary to have her crated, unless an entire express car is engaged, which is only done with very valuable animals under unusual circumstances.

As examples of freight rates the following are given. The first shows freight rates in 1901 from Chicago to New York by rail (912 miles), in cents per 100 pounds in carload lots.

	Cents.
Horses and mules	60
Cattle	28
Sheep and hogs	30
Dressed beef or dressed hogs in either refrigerator or common cars.....	42.9

The charge for a short haul of the same stock, over the Pennsylvania Railroad, in January, 1903, in carload lots, was as follows:

Charges for short haul of live stock.

	From Columbus, Ohio, to—	
	Cincinnati, 120 miles.	London, 25 miles.
Horses and mules, per 100 pounds	22	7½
Cattle, per 100 pounds	9½	5½
Sheep, per 100 pounds	9½	5½
Hogs, per 100 pounds	9½	5½

In his annual message, 1903, the governor of Wisconsin shows how greatly freight rates vary in different States. Thus he cites the cost of moving 20,000 pounds 100 miles in Wisconsin and Illinois, respectively, as follows:

Differences in freight rates in different States.

Class of freight.	Wisconsin.	Illinois.
Cattle.....	\$23.30	\$16.98
Sheep.....	30.70	25.60
Swine.....	30.20	23.10

The following rates are also of interest in this connection, being compiled from the railroad tariffs. These refer to carload lots.

Differences in freight rates in different States—Carload lots.

Class of freight.	Length of haul.	Wisconsin.	Illinois.	Iowa.
<i>Miles.</i>				
Cattle, per 100 pounds	100	\$15.00	\$9.50	\$11.32
Do	200	20.00	12.10	15.53
Do	300	25.00	14.70	20.26
Sheep, per 100 pounds.....	100	18.50	14.40	10.00
Do	200	25.00	18.30	22.00
Do	300	31.20	20.00	25.90
Swine, per 100 pounds	100	18.50	13.00	10.96
Do	200	25.00	16.50	15.80
Do	300	21.20	18.00	19.00

These figures show considerable difference in freight charges in three different States, and also considerable variation depending upon the length of haul and the railways employed. Relatively, short hauls cost more than long ones, and less than carload lots cost more than carload lots.

A contributor to the Chicago Live Stock World, August 21, 1903, writes:

It costs \$234 per car of 30 feet and \$260 per car of 36 feet to ship Oregon sheep and lambs to Chicago market. This amounts to about 80 cents per head on lambs and \$1 per head on sheep, with the commission and other charges added.

Express rates.—Express rates on live stock are on the whole very reasonable, but it is not advisable to ship other than crated animals. Individual sheep, pigs, and calves may be shipped in crates at a cost about equal to or less than freight rates, with the additional advantage of better service and quicker time. In the Central West, as well as in the East, express rates are relatively low. In the South and far West the rates are higher. The following figures illustrate express rates on long and short hauls per 100 pounds for crated animals by one of the leading express companies:

From Columbus, Ohio, to—

London, Ohio, 25 miles	\$0.80
Cincinnati, Ohio, 120 miles	1.50
Chicago, Ill., 314 miles	3.00
New York City, 805 miles	2.00

The express companies also make a specialty of expressing valuable horses in special cars for this purpose. Race horses and show stock are usually shipped by express.

STOCK CARS.

Common stock cars.—Live-stock cars are of various kinds. One may ship in a plain box car such as is commonly seen on all railroads. Such a car is 30 to 36 feet long or more, about 8 feet wide, and 7 high. If horses or cattle are placed in such a car they may be tied to the uprights in the frame of the car, or they may be penned by constructing temporary box stalls. If one horse is shipped in a car the animal may be turned loose in an improvised stall in the end of the car, where some freedom of movement will be allowed. On the floor of the car an abundance of straw or other bedding should be placed. A layer of sand on the car floor is recommended for horses of value to prevent their slipping. The shipper may fix the interior of the car to suit his purpose. If a carload of horses is to be shipped they should be placed in the car side by side, with heads the same way, and so close together that they will not lie down. The same applies to a carload of cattle.

Another type of car for shipping live stock is a crate car having slatted sides and ends. This serves excellently for warm weather, but is bad for winter. This type of car is expressly made for stock, and may or may not have feed and water troughs.

Cars for sheep and hogs are usually two stories high, such being known as "double-deckers." They are essentially the usual stock car with a second floor extending over the first at a height of about $3\frac{1}{2}$ feet. As sheep and hogs are low of stature, this is a method of construction used to provide for hauling large loads.

Improved stock cars.—As the live-stock trade has developed, improved forms of stock cars have been designed. One of the most common

forms for shipping cattle has open-barred sides, with hayracks and iron water troughs which rest in a horizontal position to hold water or feed, or which may be shifted to the side of the car in an inverted position for cleaning. These troughs usually get more or less out of condition with extended service, owing to the rough usage naturally to be expected from cattle that frequently are wild and rough.

Another and still more improved type of stock car is the palace horse car. This is a car divided into stalls which are adjustable. A horse is placed in one end of the car, his head facing the side, and a wooden partition is swung against him and fastened to make one side of a stall. A second horse is led up alongside the first, facing the same way, and another partition is swung about to form the side of a stall. Thus the entire side of the car, excepting for a space in the center, is filled with horses in independent stalls, each being furnished with mangers for holding water and hay. An alley extends along in front of the horses, and there are water pipes for use in watering at certain stages of the journey. The car also has a chest for storing grain, and overhead racks for hay and straw. Such a car is chartered, and costs so much per mile in addition to the regular tariff, this being charged by the company owning the car. The cost of such a car, compared with a common stock car, between Columbus, Ohio, and Pittsburg, Pa., is as follows, the distance being 193 miles: Cost of ordinary car, 33 cents per 100 pounds, a stallion to be listed at 5,000 pounds and a mare at 4,000 pounds, a man to accompany; cost of palace car, the same and \$12 extra. The palace horse car company has a minimum charge of \$10 for a loaded distance haul, which is for 100 miles or less; between 100 and 300 miles the charge is \$12.

Air brakes are generally provided on all cars to-day and are in use in through-freight service.

The average inside length of stock cars is about 34 feet, and the average holding capacity 18 to 22 horses, 18 to 20 cattle, 70 to 90 hogs in a single-decker, or 100 to 150 in a double-decker, and about 200 to 250 sheep in a double-deck car; of Western lambs even more may be carried. Hogs and sheep have sufficient space for lying down, but cattle and horses are expected to stand during transportation.

On long journeys horses and cattle are usually sidetracked at some local yards, where exercise and feed and water are given and several hours' rest is provided. They are then reloaded and the journey proceeds. This, however, is not the practice in a twenty-four hours' run to the market.

Some of the railroads that do a large business in transporting sheep from the far West to the Chicago market unload the stock at feeding yards 40 miles or so from Chicago and feed for a while until the sheep get well rested from the long journey and are in improved flesh; then

they are taken to market in the most salable and killable shape. Yards accommodating many thousand sheep are maintained near Chicago for this purpose.

MAKING A SHIPMENT.

Making arrangements.—Where one is to ship by freight it is customary to make arrangements in advance with the railway agent and have one or more cars switched and placed ready for loading. Advance arrangements are necessary, because cars may have to be obtained from some other point on the railroad, and, in any event, special switching orders will, as a rule, be necessary. In a smaller town or city two or three days' notice of shipment is usually expected from the consignor. Even in the largest markets one day's notice to the railroad is desirable.

Feeding and care during shipment.—Feed, water, and care en route are always given live stock when an attendant does not accompany the shipment. It is, however, necessary that the shipper furnish feed and some utensils. For horses, cattle, and sheep shipped in a stock car a supply of hay must be placed in racks in the car. In case of a small shipment the hay may be placed in a rough rack or on the car floor. For a carload lot a supply of hay may be placed along the side of the car, being, in some cases, fed through trapdoors in the roof into the racks in front of the animals. On brief runs and on express freights feeding is not usually practiced. Hogs when shipped loose in the car are usually fed corn in the ear.

Crated animals sent by express must have crates bedded and feed attached to crates on outside for long journeys. Properly made crates will have a sack pocket fastened at the end within the crate in which hay may be stuffed, which sheep or calves may nibble at leisure. A small V-shaped trough may also be placed in the end of the crate, in which grain may be fed. If these additions to the crate are provided, the agents along the line will see that the stock is watered.

Shipping crates should be neither too large nor too small, just giving room for an animal to stand erect comfortably. The width should be only 3 inches greater than the width of the body at the hips and shoulders. Much room is objectionable. Animals firmly crated, with suitable feed accompanying, can be expressed from the Atlantic to the Pacific with no trouble or injury under ordinary shipping conditions. Crates should be light yet strong.

Water is always supplied by railway and express agents along the line. If an ordinary car is used, and the journey is a long one, then a half barrel in which water can be placed should be put in a box stall convenient to the animals. A slab of wood on the water will help to keep it from slopping out. Regulation stock cars are provided

with water troughs, which are usually filled at points along the line, where water from hydrants is convenient. These may be filled according to the season and demand for drink; in warm, dry weather much more water is required than at other times. Under such conditions hogs need special attention. At some points along railways in the West, water pipes with flattened iron nozzles are inserted between the slats of the car. Water is then turned on from reservoirs, and the hogs are drenched. This refreshes them, and brings them to market in much better shape than they would be otherwise.

Feeding steers preparatory to shipment.—Feeding steers preparatory to shipment and en route is a matter of importance. John Clay, jr., a well-known buyer of Chicago, suggests the following:^a

A day or two previous to shipping, feed the cattle in a pen, and feed hay only. The secret of shipping all classes of cattle is to place them on the cars full of food, but with as little moisture as possible. A steer full of water is apt to have loose bowels and show up badly in the yards. Properly handled cattle should arrive in the sale pens dry behind and ready for a good fill of water; not very thirsty, but in good condition to drink freely. Many shippers think that by salting their cattle or feeding them oats they can fool the buyers, but it always goes against them to use unnatural amounts.

Mr. J. A. Funkhouser, writing for the Breeders' Gazette (January 18, 1893), on feeding steers for least shrinkage in a 400-mile journey, advises feeding all the hay they will eat and reducing the grain one-half for two or three days prior to shipment. If fed during transit he would feed 250 pounds of hay and $1\frac{1}{2}$ bushels of corn per car.

Discussing this same subject, A. L. Ames writes:^b

What causes heavy shrinkage in cattle? In my judgment it can be directly traced to three causes—water, weariness, and excitement. I have found that steers having to ride from 250 to 300 miles are in the worst kind of condition if started on all the water they can hold. On the day before shipping give your cattle about half their usual feed, at the same time and in the same way you have been in the habit of feeding. Give them at the same time all the good bright hay they will eat, and if you have anything extra in quality now is the time to use it. Get them just as full of hay as you can. Now, in the morning, if you have time before moving the cattle, give them all the grain they will eat, and start them out of the feed yard.

Attendants.—An attendant usually, though not always, accompanies large shipments by rail. It is customary for railroads to allow one attendant to a carload of stock, and usually he will be given accommodations in the caboose. It will be necessary for him to see that the stock is at all times properly cared for, and at the end of the journey that the car containing it is placed at the right station, convenient for unloading. A competent attendant in shipments to metropolitan stock yards may often save unnecessary switching in the yards by insisting on a prompt placing of the car or cars containing live stock. One of the

^a Live Stock Report, Chicago, September 28, 1894.

^b Wallace's Farmer, June 19, 1903.

most objectionable features of shipping by freight comes from injuries received by stock from the severe and sudden stops in switching, when heavy animals are thrown against the sides of the car or against one another, or are thrown to the floor. A watchful attendant, by properly placing his stock within the car, may prevent animals becoming bruised in this way.

THE EXPORT TRADE.

IMPORTANCE OF FOREIGN MARKETS.

The importance of our export trade to the producer of cattle can hardly be overestimated. Through the Bureau of Animal Industry the Secretary of Agriculture largely controls the conditions of that trade, and the vigilant efforts of the Department are directed continuously to maintaining our cattle free from contagious diseases and to so regulate the ocean traffic in cattle that the markets of Europe may be kept open to them. The loss to our cattle producers which might be occasioned by the closing of these markets would be incalculably disastrous; hence, on account of the conditions which control it and of the regulations promulgated by the Secretary of Agriculture with a view to maintaining it, our export trade is of profound interest to every man having an animal to sell, even though he may personally raise nothing for the export trade, and have few, if any, dealings with the exporters of cattle.

An important feature of the live-stock trade of the United States is the exporting of horses, cattle, and sheep to Europe, and more particularly to England and Scotland. This trade demands high-class products only. A considerable number of men in America make a specialty of exporting, while here and there in the country are found men who feed cattle especially for the export trade. The importance of this trade may be comprehended when we consider that there are many large ocean steamers to-day which make regular trips between America and Britain, carrying thousands of animals to the markets on the other side of the Atlantic. England in particular is a great consumer, producing but a small part of her animal food.

The magnitude of our export trade may be seen in the following figures showing the exports and values for 1902:

Exports of animals from the United States for 1902, with values.

	Number of animals.	Total value.
Cattle.....	327,118	\$24,301,969
Sheep.....	235,497	1,492,484
Horses.....	60,694	6,086,012
Mules.....	16,306	1,744,192
Hogs.....	4,582	47,186
Total.....		33,671,843

Besides the above there were sent abroad the same year over \$170,000,000 worth of meat and meat products.

As an example of the trans-Atlantic trade from one port, there were shipped from New York in one week on 11 steamers 3,984 head of cattle, and on one vessel alone 2,249 head of sheep, while 9 steamers carried a total of 17,900 quarters of beef.

INSPECTION REGULATIONS.

Very stringent export laws are essential on account of the danger of transmitting contagious diseases by sending sick or infected animals from one country to another. All European countries have protective laws, which apply to both the export and import trade. The export rules of the United States are promulgated by the Secretary of Agriculture, and are enforced by the United States Bureau of Animal Industry. These rules have been issued from time to time, as occasion has made it necessary. Every person shipping stock abroad must export subject to our laws and under the supervision of officials of the Bureau of Animal Industry. The following are some of the essential parts of our export regulations now in force, omitting details:

All live stock shipped to foreign countries must be carefully examined by veterinary inspectors of the Bureau of Animal Industry. Railroad companies must furnish clean disinfected cars for inland transportation, and the stock yards at ports of shipment must keep separate, clean, and disinfected quarters for export stock. Animals may be inspected at the stock yards at Chicago, Kansas City, Omaha, St. Joseph, Mo., National Stock Yards, Ill., Indianapolis, Buffalo, and Pittsburg, and at the following export ports: Portland, Me., Boston, New York, Philadelphia, Baltimore, Norfolk and Newport News, Va., Port Royal, S. C., New Orleans, and Galveston.

Shippers are required to notify the inspector of the yards of intended shipments of animals, numbers, and designation of cars to be shipped in, locality from which animals have been bought, names of feeders, and such other information as may be necessary for identification of the place from which animals for export came. All cattle must be inspected and tagged at port of export. The movement of animals on public highways or to other cars or quarters is subject to the supervision and approval of the inspector. The supervision of the movement of animals from cars, yards, and stables to ocean steamers at the ports of export is in charge of the inspector of the port. This official notifies the collector of the port or his deputy of the various shipments of animals that are entitled to clearance papers, and authorized certificates of the inspection of the animals is given to the consignors for transmission with the bills of lading. Persons desiring to send horses, cattle, or sheep abroad must notify the inspector of the port from which they expect to ship at least two days before the date of shipment.

REGULATIONS FOR STABLING AND CARE ON VESSELS.

The Bureau of Animal Industry prescribes the stabling conditions to be provided for live stock in shipment abroad. Animals exported must not be located so as to interfere with the proper management of the vessel. Cattle must have 6 feet of vertical space on all decks, free of all obstructions. Cattle carried on the upper or exposed decks must be allowed a space 2 feet 8 inches in width by 8 feet in length. Those loaded between decks must be allowed a space or 2 feet 8 inches in width by 8 feet in length, excepting in well-ventilated regular cattle ships, where a width of 2 feet 6 inches is allowed. Four head of cattle are allowed in one pen, excepting at the ends of a row, where 5 may be placed. With cattle under 1,000 pounds weight, a width of 2 feet 3 inches is allowed. Cattle in single stalls are given a width of 3 feet. The space for each full-grown sheep is 4 feet long by 14 inches wide, and for lambs or sheep under 100 pounds weight 4 feet by 12 or 13 inches, 2 rows of sheep standing in the 8 feet width of pen. Sheep pens are not to exceed 20 by 8 feet where two tiers are carried, and each tier must have a clear vertical space of 3 feet. All horses must have 6 feet 3 inches clear vertical space from beams of deck overhead to deck under foot. Each horse must be given a space 2 feet 6 inches wide by 8 feet long, and for very large horses an additional space may be required. Each horse must be kept in a separate stall.

The regulations cover in considerable detail the space to be occupied by alleys, pens, etc., the kind of fastenings to be used for stock, the flooring of the decks, ventilation and light, the hatches, food and water, attendants, head ropes, etc.

All vessels not provided with pipes for watering animals must carry casks and hogsheads of not less than 400 gallons total capacity for each 100 head of cattle and horses, and an additional amount in equal proportion for sheep. Fresh water must also be provided from condensers.

The employment of all attendants is subject to the approval of the owners or agents of steamships and of the inspector of the port. Such men must be reliable and be signed as a part of the ship's crew. Shippers of export cattle must make affidavit of the character of the attendants. For each 35 head of cattle on steamers with water pipes the entire length of both sides of compartments, 1 attendant is required; on steamers not so equipped, 1 man to 25 cattle is the rule. The captain of the vessel must furnish additional help when water is to be pumped by hand. In winter there is to be 1 man to 150 sheep, and in summer 1 man to 200 sheep. One attendant is required for each 22 head of horses.

Cattle are tied with three-fourths-inch rope, which is to be of manila, sisal, or jute, and not to be used but once. These head ropes

after use are seized and destroyed by the inspectors. All halters, blankets, stable utensils, feed bags, and feed troughs must be disinfected if to be returned to the United States.

All cattle and sheep must be rested at least twenty-four hours in the yards at the port of embarkation before the vessel sails. They must also be inspected and tagged before loading. Horses shipped over 500 miles are not allowed on board unless they have received at least eighteen hours' rest, in stables designated by the inspector, before being loaded. Horses are not to be placed on the steamer until the rest of the cargo is loaded.

Many special regulations for the traffic in live stock and animal products between the United States and foreign countries have been promulgated by the Secretary of Agriculture from time to time.

METHODS AND PRACTICES.

The writer has crossed the Atlantic a number of times on live-stock steamers, with the special purpose of observing the methods of handling stock in the trans-Atlantic trade. These trips included vessels sailing from Montreal and New York. The following notes relate to observations taken on these trips:

Arrangement of stalls on decks.—On the decks carrying cattle is a series of posts so arranged that by placing horizontal rods of the same size against them in sockets a series of inclosures or skeleton stalls are provided. One row extends along each side of the vessel; then comes an alley, usually about $2\frac{1}{2}$ feet wide, and facing this another row of stock, while in the center, facing another alley, will be one or two more rows. Four or five rows of cattle are thus usually arranged. Two iron bars in front and two on each side, about 1 foot apart, the highest est $3\frac{1}{2}$ feet above the floor, inclose a space with a depth of 8 and a frontage of 10 feet. Four cattle are tied within that space, each occupying a space $2\frac{1}{2}$ by 8 feet. The cattle are all tied by head or neck ropes to fastening holes in the lower rod or in planks in front every $2\frac{1}{2}$ feet apart. Before the animals are loaded the stalls are well bedded with baled straw.

Loading the vessel.—The cattle are driven upon the steamer from a transport, which is brought alongside. On one vessel 850 cattle were driven aboard in lots of 20 or so at a time. These included 400 Colorado steers, animals naturally wild, yet they were handled rapidly and without trouble. The different alleys were arranged so that by closing some the cattle were obliged to pass along in line into certain stalls, which they quickly filled. Men tied them in place soon after.

The horses are kept in wooden stalls about the central part of the deck so as to feel as little movement as possible when at sea. One horse is placed in a stall at the end of a space that is to be occupied

by a row of stalls. After the horse is in place the side of the stall is dropped into place so as to form one side of the next stall, into which a horse is then led, after which he is inclosed, and so on until an entire row of stalls is filled.

The sheep are kept on the upper decks in box stalls of various sizes, built to suit the space available. The pens are usually two tiers deep, or, in other words, are double-decked. The forward part of the vessel holds the sheep. On one vessel over 1,300 sheep were rapidly driven on board from the transport by using a trained bellwether that led detachments to the different pens with the assistance of attendants.

Feeding during voyage.—There was not much variation in the feeding of the stock. The cattle and horses were watered from pails about 5 o'clock a. m., after which they were fed with grain and hay. The cattle were again fed grain about 3 p. m., followed by hay. Some of the horses were given another grain feed about the same time or a little later, while others were fed grain three times a day. Sheep were fed hay and a mixture of equal parts of corn meal and whole oats, the grain being fed once a day, along in the afternoon, but this is sometimes varied.

Horses were generally given bran and whole oats as a mash, with sometimes the addition of a few handfuls of oil meal and a pinch of salt. The cattle part of the time received ear corn and part of the time corn meal. A poor grade of timothy hay or mixed hay was usually fed. On a Canadian boat the cattle superintendent stated that Canadian cattle would not eat ear corn, consequently they were fed cracked or shelled corn. The writer saw one lot of cattle under the charge of this superintendent fed two parts fine bran, one part cracked corn, and some pea meal.

It is not customary to feed much grain during the early part of the voyage, but to gradually increase the amount until, near the end of the trip, which usually lasts from ten to thirteen days, a strong grain ration is fed.

As the owners or shippers must furnish the feed while the stock is on shipboard, they may feed whatever they desire. Men differ in their attention to this subject, but the rations referred to above are given by experienced shippers.

Care during voyage.—Cattle and sheep on shipboard do not require a great deal of attention outside of feeding, watering, and bedding. Some animals appear to be somewhat seasick, but they soon recover from this and eat well. Horses are more difficult to handle satisfactorily. They catch cold from drafts, not infrequently have fever, and in many cases require much watchful care. Horse shippers find it most profitable to have only experienced attendants in charge.

The manure under the stock is not disturbed from the beginning to

the end of the voyage, fresh bedding being placed over the manure as frequently as is necessary. At the end of the voyage, after unloading, the vessel is thoroughly cleaned and disinfected with whitewash in the stock quarters.

Insurance of stock exported.—Horses are not usually insured excepting in the entire consignment; consequently, the death of one animal usually means the shipper's loss. Steers are insured individually, but very few of them die. The writer received a letter from the captain of one ocean cattle steamer, in which he stated that he had carried 25,000 cattle across the Atlantic without the loss of a single head.

EXPENSES AND LOSSES.

Charges for ocean transportation.—The expense of shipping across the ocean varies. In 1897 the writer, in a contribution to the Breeders' Gazette, wrote as follows:

Is the export trade a good business for the shipper? There are now only two large shippers in New York, and numbers have failed, while others have made good money out of it. Just now there is money in cattle. The cost for delivery in carload lots is not far from \$25 from Chicago to Liverpool. The freight and insurance cost about \$12 to \$13, while the feed, cost of labor, etc., make up the balance. A steer bringing \$60 in Chicago will fetch, in good condition, from \$90 to \$100 in England.

And again in 1900, in the same journal:

It now costs about \$11, including the premium on insurance of \$80 a head, to ship cattle from Montreal to Glasgow, and besides this \$3 per head is figured for cost of feed and care. Horses are transported for about \$20 a head now, but often the price is much less. Nine sheep are allowed the space of one steer. Where pure-bred stock is shipped from Europe to America, the rate is somewhat higher.

Loss from shrinkage and death of animals.—The loss from shrinkage between Chicago and English ports is generally estimated by exporters to be about 65 pounds per head for cattle. In the report of the American Humane Society for 1879 it is estimated that from 5 to 10 per cent of the real value of cattle was lost by shrinkage in weight, by death, and from injury in transit. Of cattle shipped to English ports in 1880, a little over 4½ per cent were lost on the voyage. Sheep suffered about the same, while hogs lost over 12 per cent. Since 1880, as a result of British and American supervision of the shipping trade in live stock, the loss of stock at sea while in transit has been very much reduced, the conditions in many respects having been greatly improved.